Cryogenics

Index to Volume 34 (1994)

No 1 (January) pp 1–96
No 2 (February) pp 97–176
No 3 (March) pp 177–256
No 4 (April) pp 257–336
No 5 (May) pp 337–472
No 6 (June) pp 473–552
No 7 (July) pp 553–624
No 8 (August) pp 625–696
No 9 (September) pp 697–776
No 10 (October) pp 777–896
No 11 (November) pp 897–968
No 12 (December) pp 969–1064

Article index (titles in italics refer to Research and technical notes)

Number 1/January

Calorimetric a.c. loss measurement in the microwatt range: a new simplified measuring technique
C. Schmidt 3

Viscous expander
G. Ke and T. Hashimoto 9

On the integral Joule-Thomson effect
B.-Z. Maytal and A. Shavit 19

Experimental investigation of 4 K pulse tube refrigerator
J.L. Gao and Y. Matsubara 25

Modified orifice pulse tube refrigerator without a reservoir
C. Wang, P. Wu and Z. Chen 31

Dynamic modelling of Stirling cryorefrigerator
C. Minas 37

Dynamic and thermodynamic analysis of doubly motorized miniature Stirling cryocooler using double coil linear motors
A.S. Gaunekar, K.G. Narayankhedkar and S.L. Bapat 43

Cool-down and fill-up of non-adiabatic helium transfer line
S.P. Gorbachev, I.V. Gorlach and M.N. Bocharov 51

Thermal conductivity of YBCO (123) and YBCO (211) mixed crystals prepared by MMTG
M. Ikebe, H. Fujishiro, T. Naito, K. Noto, S. Kohayashi and S. Yoshizawa 57

Critical currents up to 71 000 A cm^{-2} at 77 K in melt textured YBCO doped with $BaSnO_3$
M. Lepropre, I. Monot, M.P. Delamare, M. Hervieu, Ch. Simon, J. Provost, G. Desgardin, B. Raveau, J.M. Barbut, D. Bourgault and D. Braithwaite 63

Effects of thermal shunt to substrate on normal zone propagation in high T_c superconducting thin films
C. Levillain, P. Manuel and P.G. Therond 69

Quench energies of uncooled superconductors
L. Dresner 77

Losses and stability in superconducting wire in a.c. fields with frequencies up to 2.5 kHz
I.F. Voloshin, L.M. Fisher, E. Yu. Klimenko, N.N. Martovetsky and I.M. Hlasnik 83

Thermal conductance of copper-cyanoacrylate adhesive $YBa_2Cu_3O_{7-\delta}$ joints between 5 and 300 K
N. Wendling, J. Chaussy, J. Mazuer and J. Odin 89

Number 2/February

Dynamics of liquid helium boil-off experiments with a step change in pressure
Y.S. Cha, R.C. Niemann and J.R. Hull 99

Temperature behaviour of permeation of helium through Vespel and Torlon
U. Schmidtchen, T. Gradt, H. Börner and E. Behrend 105

On the connection between normal zone voltage and hot spot temperature in uncooled magnets
L. Dresner 111

High T_c leads for remote sensing applications *M.W. Hooker, S.A. Wise, R. Selim, R. Caton and A.M. Buoncristiani* 119

Quenching recovery of tape/film type superconductors
A. Unal and M.-C. Chyu 123

Quench propagation in high T_c superconductors
R.H. Bellis and Y. Iwasa 129

Design of superconducting current leads
R. Wesche and A.M. Fuchs 145

Experimental results on instability caused by non-uniform current distribution in the 30 kA NbTi Demo Poloidal Coil (DPC-U) conductor
N. Koizumi, K. Okuno, Y. Takahashi, H. Tsuji, M. Nishi, K. Yoshida, M. Sugimoto, T. Isono, T. Sasaki, H. Hiue, Y. Yasukawa, F. Hosono, T. Sasaki, Y. Wadayama, H. Tsukamoto and S. Shimamoto 155

Thermal expansion of some advanced ceramics applicable as specimen holders of high T_c superconductors
M. Okaji, K. Nara, H. Kato, K. Michishita and Y. Kubo 163

Cylindrical pressure gauge
V.A. Mikheev, N. Masuhara, Th. Wagner, G. Eska, P. Mohandas and J. Saunders 167

Number 3/March

Velocity measurement of He II thermal counterflow jet accompanied by second sound Helmholtz oscillation
A. Nakano and M. Murakami 179

Heat transport in He II channel with phase transition
T. Okamura, T. Suzuki, N. Seki and S. Kabashima 187

Numerical analysis of thermally induced transients in forced flow of supercritical helium
X. Cheng 195

Propagation of thermal waves with lateral heat transfer
R.K. Sahoo 203

Paramagnetic salt pill design for magnetic refrigerators used in space applications
C. Hagmann, D.J. Benford and P.L. Richards 213

Two-stage magnetic refrigerator for astronomical applications with reservoir temperatures above 4 K
C. Hagmann and P.L. Richards 221

Characteristics of refrigerator with adsorption pumping of liquid working agent at temperatures lower than 65 K
G.K. Lavrenchenko and J.V. Zmitrochenko 227
New type of cryogenic semiconductor resistance thermometer
S.A. Obukhov 237
Unexpected behaviour of core materials of electrical coils at low temperatures
P.K. Mukhopadhyay, P. Barat, S.K. Kar, S.K. Bandyopadhyay and P. Sen 241
Microdefects in relatively fast cooling MTG YBCO specimen
J.C.L. Chow, P.C.W. Fung, Z.L. Du, T.F. Yu and Y.C. Mok 245
Critical current density dependence on orientation of Bi-free needle-like crystals in $Bi_2Sr_2Ca_1Cu_2O_8$ thick films
S. Patel 251

Number 4/April

Novel configuration of three-stage pulse tube refrigerator for temperatures below 4 K
Y. Matsubara and J.L. Gao 259
Tandem magnetic refrigerator for 1.8 K
S. Jeong, J. L. Smith, Jr and Y. Iwasa 263
Theoretical analysis of a dynamically balanced Gifford–McMahon cryorefrigerator
C. Minas 271
Three metre long horizontal cryostat producing ultracold neutrons using superfluid liquid helium at 0.5 K (Mark 3000)
H. Yoshiki, K. Sakai, T. Kawai and S. Goto'o 277
Techniques for isolation and electrical characterization of individual grain boundaries in polycrystalline superconductors
G. Schindler, C. Sarma, D.G. Haase, C.C. Koch and A.I. Kingon 287
Interstrand coupling effect on losses and current distributions in superconducting cable conductors
S. Kawabata, F. Sumiyoshi, T. Kawashima, T. Mito, K. Takahata and H. Takano 293
Influence of sausaging effect on *V–I* characteristics of silver-sheathed Bi-2223 tapes
K. Osamura, M. Kamo, S.S. Oh and S. Ochiai 303
Mechanical strain effects in design considerations of high T_c superconducting pancake coil magnets
S. Patel 309
Self-field effect and current–voltage characteristics of a.c. superconductors
M. Polák, I. Hlásnik, S. Fukui, N. Ikeda and O. Tsukamoto 315
Effect of processing parameters on superconducting properties of Ag-sheathed Bi-2223 tape
K. Venugopal and G. Swaminathan 325
Extraction of anisotropic critical current densities and flux pinning potentials
H.L. Ji, Z.X. Shi, Z.Y. Zeng, X. Jin, H.C. Fan, X.X. Yao, X.S. Rong, Y.M. Ni and S.X. Zhao 329

Number 5/May

Lambda point experiment in microgravity
J.A. Lipa, D.R. Swanson, J.A. Nissen and T.C.P. Chui 341
On-orbit superfluid transfer: preliminary results from the SHOOT Flight Demonstration
M. DiPirro, P. Shirron and J. Tuttle 349
SHOOT Dewar support strap design and performance
K.F. Weintz, M.I. Basci and J.M. Uber 357
Flight performance of the SHOOT liquid acquisition devices
P.J. Shirron, M.J. DiPirro and J. Tuttle 361
Thermal stratification of liquid helium in the SHOOT Dewars
J. Tuttle, M.J. DiPirro and P.J. Shirron 369
Verification testing of the Superfluid Helium On-Orbit Transfer (SHOOT) experiment
S. Volz, C. Conaty and K. Weintz 375
Prediction of natural frequency of the NASA 80 K cooler by the Stirling refrigerator performance model
S.W.K. Yuan, L.G. Naes and T.C. Nast 383
Novel orbital disconnect support for cryogenic tanks
A. Seidel, P. Schwabbauer, K.H. Hilmer, G. Pulkert, R. Schällig and C. Jewell 389
Orbital operation of Cryogenic Limb Array Etalon Spectrometer (CLAES) cryostat
L.G. Naes, T.C. Nast, G.A. Bell, D.A. Pickett, C. Stouffer and C. Cygnarowicz 393
Analogue adaptive vibration cancellation system for Stirling cryocoolers
S.A. Collins, A.H. von Flotow and J.D. Paduano 399
Description of SHOOT command and monitoring system
J.C. Shapiro and G.L. Villeré 407
Simulations of cryogen expulsion from a space depot under zero gravity
M.-W. Hsu and R.J. Witt 415
Dilution refrigerator for space applications with a cryocooler
A. Benoît and S. Pujol 421
Infrared detector requirements which drive cryogenic development
R.E. McMurray, Jr 425
Development of two-stage small Stirling cycle cooler for temperatures below 20 K
M. Kyoya, K. Narasaki, K. Ito, K. Nomi, M. Murakami, H. Okuda, H. Murakami, T. Matsumoto and Y. Matsubara 431
Cryocooler resonance characterization
R.G. Ross, Jr, D.L. Johnson, G.R. Mon and G. Smedley 435
Update on the design and performance of the cryogenic subsystem for the AXAF X-ray spectrometer
R.A. Hopkins, S.J. Nieczkoski and S.R. Breon 443
Contact resistance of 500 mesh regenerator screens
A.C. Lee, K.V. Ravikumar and T.H.K. Frederking 451

Number 6/June

Exergy maximization in cryogenic regenerators
R.K. Sahoo and S.K. Das 475
New Ericcson type cryogenic cooler
E.R. Glans 483
Thin film platinum resistance thermometers: calibration and mathematical description of $T(R)$ function
D.A. Dimitrov, A.L. Zahariev, J.K. Georgiev, G.A. Kolev, J.N. Petrinski and Tz. Ivanov 487
Influence of twist pitch and sample length on proximity effect coupling in multifilamentary composites described in terms of a field independent, two current region model
M.D. Sumption and E.W. Collings 491
Flux jump instabilities in a bulk $Bi_2Sr_2CaCu_2O_{8+x}$ flux tube
J.W. Burgoyne and J.H.P. Watson 507
Stability criterion for composite superconductor of large aspect ratio
S.Y. Seol and M.C. Chyu 513
Prediction of superconductor behaviour when subjected to a local thermal disturbance
S.Y. Seol and M.C. Chyu 521
D.c. magnetization study of fine-filamentary NbTi superconductors
M. Majoros, V. Ottoboni and S. Zannella 529

Predictive model for critical current density of Ag-sheathed $Bi_2Sr_2Ca_1Cu_2O_8$ composite tapes with fabrication defects
S. Patel, T. Haugan, S. Chen, F. Wong, E. Narumi and D.T. Shaw 537
Test results of a 1 kA (2 kA)-20 kV HTSC current lead model
P.F. Herrmann, E. Beghin, G. Bottini, C. Cottevieille, A. Leriche, T. Verhaege and J. Bock 543
Simple design for dilution refrigerator with base temperature of 2.3 mK
D.I. Bradley, M.R. Follows, I.E. Miller, R. Oswald and M. Ward 549
Liquid nitrogen cooled colour centre laser cryostat
R.H. Mitchell 550

Number 7/July

Flow rate instabilities under self-sustained cooling
I. Kh. Rudman 555
Natural convection in large He II baths
N.H. Ramadan and R.J. Witt 563
Gap size effect on liquid helium breakdown
J. Gerhold, M. Hubmann and E. Telser 579
^{3}He/^{4}He dilution refrigerator combined with Gifford–McMahon cooler
K. Uhlig and W. Hehn 587
Isothermal model of pulse tube refrigerator
S.W. Zhu and Z.Q. Chen 591
High frequency thermal modulation of superconducting NbTi thin film by use of laser diode
F. Ayela, J.L. Bret and J. Chaussy 597
A.c. losses in Bi-2212 superconducting magnet at 20 K
T. Hase, T. Egi, K. Shibutani, S. Hayashi, R. Ogawa and Y. Kawate 603
Evaluation of texture in silver sheathed BPSCCO tapes using angular magnetoresistance measurements
G. Swaminathan, M.V.T. Dhananjeyan, K. Venugopal and V. Ramamurthy 609
J_c characteristics of BiPbSrCaCuO silver clamped thick film
G.C. Han, H.M. Han, Z.H. Wang, S.X. Wang, F.T. Wang, W.F. Yuan and J.L. Chen 613

Number 8/August

Adiabatic losses in Stirling cryocoolers: a stratified flow model
L. Bauwens 627
^{4}He refrigerator for space
J.J. Bock, L. Duband, M. Kawada, H. Matsuhara, T. Matsumoto and A.E. Lange 635
Peculiar behaviour of He II disturbances due to sloshing dynamics driven by jitter accelerations associated with slew motion in microgravity
R.J. Hung, H.L. Pan and Y.T. Long 641
Thermal conductance of pressed metallic contacts augmented with indium foil or Apiezon grease at liquid helium temperatures
L.J. Salerno, P. Kittel and A.L. Spivak 649
Thermal conductivity of wood at low temperatures
Th. Wagner, S. Götz and G. Eska 655
Transversal heat transfer in the cable-in-conduit conductor for the Wendelstein 7-X magnet system
X. Cheng 659
High temperature RF SQUID gradiometer applied to non-destructive testing
C.-X. Fan, D.F. Lu, K.W. Wong, Y. Xin, B. Xu, N.S. Alzayed, M. Chester and D.E. Knapp 667
Investigation of critical state in melt processed $YBa_2Cu_3O_{7-\delta}$ thick films
D.A. Cardwell, A.R. Jones, N.J.C. Ingle, A.M. Campbell, T.W. Button, N. McN. Alford, F. Wellhofer and J.S. Abell 671
Time constants of normal metals and superconductors at different ramp rates during a cycle
S. Takács, H. Kaneko and J. Yamamoto 679
Thermal conductivity of Ag-doped Bi-2212 superconducting materials prepared by the floating zone method
M. Matsukawa, F. Tatezaki, K. Noto, H. Fujishiro, K. Michishita and Y. Kubo 685
Cryogenic CMOS without an isolation well
J.G. Jang and G. Gildenblat 689

Number 9/September

Thermodynamic analysis of the basic pulse-tube refrigerator
P.C.T. de Boer 699
Experimental analysis of the multi-bypass principle in pulse tube refrigerators
J.H. Cai, J.J. Wang, W.X. Zhu and Y. Zhou 713
Experience with Displex GM-type refrigerators on magnetic resonance imaging cryostats
R.C. Longsworth and R.B. Sloan 717
Performance of ideal flow regulated Joule-Thomson cryocooler
B.-Z. Maytal 723
Development of a computer model for three-stage, split type, free displacer Stirling cryocooler
M.D. Atrey, S.L. Bapat and C. Heiden 727
Unsteady heat transfer in He II with cylindrical geometry
S.K. Nemirovskii, L.P. Kondaurova and A. Ja. Baltsevich 733
Digitally controlled current source for demagnetization refrigerators
P. Skyba, A. Gréser, Z. Krasnay and N. Smolka 739
Computation and experiments on the static and dynamic characteristics of high T_c superconducting levitation
N. Takeda, M. Uesaka and K. Miya 745
Superconducting Nb_3Sn joints by chemical vapour deposition
P.G. Kosky, H.C. Peters, C.L. Spiro, D.S. McAtee, L. Rumaner and D. Marsh 753
Normal zone acceleration: a new model to describe the quench process in superconductors with changing current
N.A. Buznikov, A.A. Pukhov and A.L. Rakhmanov 761
Heat capacity of thick-film resistor thermometers and pure RuO_2 at low temperatures
Ya. E. Volokitin, R.C. Thiel and L.J. de Jongh 771
GaAs based varicap as tunable capacitance at millikelvin temperatures
M. Nikl, P. Fabeni, G.P. Pazzi, A. Ranfagni, D. Mugnai, B. Sopko, G. Ventura and K. Sassoli 773

Number 10/October

Review of stability experiments on cable-in-conduit conductors
J.W. Lue 779
Limiting current and stability of cable-in-conduit conductors
L. Bottura 787
Full featured implementation of quench simulation in superconducting magnets
S. Pissanetzky and D. Latypov 795
Diameter-dependent critical current densities for superconducting Bi-2212/Ag wires
R. Wesche, A.M. Fuchs, B. Jakob and G. Pasztor 805
Interstrand resistance of SSC magnets
V.T. Kovachev, M.J. Neal, D.W. Capone II, W.J. Carr, Jr and C. Swenson 813
Numerical analysis of frozen field model for levitation force of HTSC
M. Tsuchimoto, T. Kojima and T. Honma 821

Cooling of small SMES system with forced flow supercritical helium
R.M. Schöttler 825
Optical analysis of Al-layer oxidation during Nb/Al_2O_3–Al/Nb Josephson junction fabrication
R. Dolata, M. Neuhaus and W. Jutzi 833
Variable temperature insert for a.c. susceptibility measurements at a.c. field amplitudes up to 0.1 T
F. Gömöry, P. Lobotka and K. Fröhlich 837
Dynamic Young's moduli of space materials at low temperatures
Z. Zhang, L.Z. Zhao, Z.H. Tu and P.Q. Zhang 839
Insertable dilution refrigerator for characterization of mesoscopic samples
J.P. Pekola and J.P. Kauppinen 843

Number 11/November

VAMAS intercomparison of critical current measurements on Nb_3Sn superconductors: a summary report
H. Wada, C.R. Walters, L.F. Goodrich and K. Tachikawa 899
Cryogenic properties of unidirectional composites
R.P. Reed and M. Golda 909
Optimum temperature staging of cryogenic refrigeration system
S. Jeong and J.L. Smith, Jr 929
Design chart of gas-cooled current leads made of copper of different *RRR* values
K. Maehata, K. Ishibashi and Y. Wakuta 935
Irreversibility line and critical current densities of '1223' cuprate $TlBa_2Ca_2Cu_3O_9$: a single crystal study
A. Wahl, V. Hardy, A. Maignan, C. Martin and B. Raveau 941
Effect of current on transport critical temperature of silver supported $Bi_2Sr_2Ca_1Cu_2O_8$ thick films with Bi-free needle-like crystals
S. Patel 947
Hall sensor applicable to cryogenic temperatures for magnetic fields up to 25 T
A. Sawada, S. Sakatsume, T. Goto, S. Nakamura, H. Matsui, R. Settai, Y. Ohtani, K. Watanabe and A. Hoshi 953
Low temperature radio frequency shielding of exfoliated graphite
M. Rall, M.D. Evans, P.M. Andersen and N.S. Sullivan 957
NJ3600L FET as a very low-noise, cooled amplifier for infrared bolometry
L. Lanzi, K. Sassoli and G. Ventura 959
Paper-based heat shield for nuclear refrigerators
J. Nyéki, V. Pavlík, P. Skyba, N. Smolka and A. Feher 961

Number 12/December

Measurements and modelling of recuperator for superfluid Stirling refrigerator
J.G. Brisson and G.W. Swift 971
Peak and recovery heat flux densities in bath of subcooled superfluid helium
R. Wang 983
Flow structure of thermal counterflow jet in He II
A. Nakano, M. Murakami and K. Kunisada 991
Performance of absorption refrigeration cycle at maximum cooling rate
J. Chen 997
Balloon-borne ^{3}He cryostat for millimetre bolometric photometry
P. Palumbo, E. Aquilini, P. Cardoni, P. de Bernardis, A. De Ninno, L. Martinis, S. Masi and F. Scaramuzzi 1001
Design of platinum resistance thermometer with small magnetic field correction
K. Nara, H. Kato and M. Okaji 1007
Influence of superconducting magnet winding structure on conductor cryostability
S.S. Ivanov, N.N. Balashov and I.O. Shchegolev 1011
Stabilized operation of 30 kA NbTi Demo Poloidal Coil (DPC-U) with uniform current distribution in conductors
N. Koizumi, K. Okuno, Y. Takahashi, H. Tsuji and S. Shimamoto 1015
Effect of heat treatment on diffusion of oxygen in silver-sheathed oxide superconductors
S. Patel 1023
Deformation of silver-sheathed oxide superconducting tapes by trapped gases
S. Patel, T. Haugan and D.T. Shaw 1031
Strain characteristics of Nb_3Sn multifilamentary wires with CuNb reinforcing stabilizer
K. Katagiri, K. Watanabe, K. Noto, K. Goto, T. Saito, O. Kono, A. Iwamoto, M. Nunogaki and T. Okada 1039
JFET cooled amplifier for d.c. SQUID
G.V. Pallottino and A.E. Zirizzotti 1045

Author index

Abell, J.S. 671
Alford, N. McN 671
Alzayed, N.S. 667
Andersen, P.M. 957
Aquilini, E. 1001
Atrey, M.D. 727
Ayela, F. 597

Balashov, N.N. 1011
Baltsevich, A.Ja. 733
Bandypadhyay, S.K. 241
Bapat, S.L. 43, 727
Barat, P. 241
Barbut, J.M. 63
Basci, M.I. 357
Bauwens, L. 627
Beghin, E. 543
Behrend, E. 105
Bell, G.A. 393
Bellis, R.H. 129
Benford, D.J. 213
Benoit, A. 421
Bocharov, M.N. 51
Bock, J. 543, 635
Borner, H. 105
Bottini, G. 543
Bottura, L. 787
Bradley, D.I. 335, 549
Breon, S.R. 443
Bret, J.L. 597
Brisson, J.G. 971
Buoncristiani, A.M. 119
Burgoyne, J.W. 507
Button, T.W. 671
Buznikov, N.A. 761

Cai, J.H. 713
Campbell, A.M. 671
Capone II, D.W. 813
Cardoni, P. 1001
Cardwell, D.A. 671
Carr, Jr, W.J. 813
Caton, R. 119
Cha, Y.S. 99
Chaussy, J. 89, 597
Chen, J. 613, 997
Chen, S. 537
Chen, Z.Q. 591
Chen, Z. 31
Cheng, X. 195, 659
Chester, M. 667
Chow, J.C.L. 245
Chui, T.C.P. 341
Chyu, M.C. 123, 513, 521
Collings, E.W. 491
Collins, S.A. 399
Conaty, C. 375
Cottevieille, C. 543
Cygnarowicz, C. 393

Das, S.K. 475
De Ninno, A. 1001
Delamare, M.P. 63
Desgardin, G. 63
Dhananjeyan, M.V.T. 609
DiPirro, M.J. 349, 361, 369
Dimitrov, D.A. 487
Dolata, R. 833
Dresner, L. 77, 111
Du, Z.L. 245
Duband, L. 635

Egi, T. 603

Eska, G. 167, 655
Evans, M.D. 957

Fabeni, P. 773
Fan, C.-X. 667
Fan, H.C. 329
Feher, A. 961
Fisher, L.M. 83
Follows, M.R. 335, 549
Frederking, T.H.K. 451
Fuchs, A.M. 145, 805
Fujishiro, F. 685
Fujishiro, H. 57
Fukui, S. 315
Fung, P.C.W. 245

Gao, J.L. 25, 259
Gaunekar, A.S. 43
Georgiev, J.K. 487
Gerhold, J. 579
Gildenblat, G. 689
Glans, E.R. 483
Golda, M. 909
Goodrich, L.F. 899
Gorbachev, S.P. 51
Gorlach, I.V. 51
Goto'o, S. 277
Goto, K. 1039
Goto, T. 953
Gotz, S. 655
Gradt, T. 105
Greser, A. 739

Hagmann, C. 213, 221
Han, G. 613
Han, H. 613
Hardy, V. 941
Hase, T. 603
Hashimoto, T. 9
Hasse, D.G. 287
Haugan, T. 537, 1031
Hayashi, S. 603
Hehn, W. 587
Heiden, C. 727
Herrmann, P.F. 543
Hervieu, M. 63
Hilmer, K.H. 389
Hlasnik, I. 83, 315
Honma, T. 821
Hooker, M.W. 119
Hopkins, R.A. 443
Hoshi, A. 953
Hsu, M.-W. 415
Hubmann, M. 579
Hull, J.R. 99
Hung, R.J. 641

Ikebe, M. 57
Ikeda, N. 315
Ingle, N.J.C. 671
Ishibashi, K. 935
Isono, T. 155
Ito, K. 431
Ivanov, S.S. 1011
Ivanov, Tz. 487
Iwamoto, A. 1039
Iwasa, Y. 129, 263

Jakob, B. 805
Jang, J.G. 689
Jeong, S. 263, 929
Jewell, C. 389
Ji, H.L. 329
Jin, X. 329
Johnson, D.L. 435
Jones, A.R. 671
Jutzi, W. 833

Kabashima, S. 187
Kamo, M. 303
Kaneko, H. 679
Kar, S.K. 241
Katagiri, K. 1039
Kato, H. 163, 1007
Kauppinen, J.P. 843
Kawabata, S. 293
Kawada, M. 635
Kawai, T. 277
Kawashima, T. 293
Kawate, Y. 603
Ke, G. 9
Kingon, A.I. 287
Kittel, P. 649
Klimenko, E.Y. 83
Knapp, D.E. 667
Koch, C.C. 287
Kohayashi, S. 57
Koizumi, N. 155, 1015
Kojima, T. 821
Kolev, G.A. 487
Kondaurova, L.P. 733
Kono, O. 1039
Kosky, P.G. 753
Kovachev, V.T. 813
Krasnay, Z. 739
Kubo, Y. 163, 685
Kunisada, K. 991
Kyoya, M. 431

Lange, A.E. 635
Latypov, D. 795
Lavrenchenko, G.K. 227
Lee, A.C. 451
Leproproe, M. 63
Leriche, A. 543
Levillain, C. 69
Lipa, J.A. 341
Long, Y.T. 641
Longsworth, R.C. 717
Lu, D.F. 667
Lue, J.W. 779

Maehata, K. 935
Maignan, A. 941
Majoros, M. 529
Manuel, P. 69
Marsh, D. 753
Martin, C. 941
Martinis, L. 1001
Martovetsky, N.N. 83
Masi, S. 1001
Masuhara, N. 167
Matsubara, Y. 25, 259, 431
Matsuhara, H. 635
Matsui, H. 953
Matsukawa, M. 685
Matsumoto, T. 431, 635
Maytal, B.Z. 19, 723
Mazuer, J. 89
McAtee, D.S. 753
McMurray Jr, R.E. 425
Michishita, K. 163, 685
Mikheev, V.A. 167
Miller, I.E. 335, 549
Minas, C. 37, 271
Mitchell, R.H. 550
Mito, T. 293
Miya, K. 745
Mohandas, P. 167
Mok, Y.C. 245
Mon, G.R. 435
Monot, I. 63
Mugnai, D. 773
Mukhopadhyay, P.K. 241
Murakami, H. 431
Murakami, M. 179, 431, 991

Naes, L.G. 383, 393
Naito, T. 57
Nakamura, S. 953
Nakano, A. 179, 991
Nara, K. 163, 1007
Narasaki, K. 431
Narayankhedkar, K.G. 43
Narumi, E. 537
Nast, T.C. 383, 393
Neal, M.J. 813
Nemirovskii, S.K. 733
Neuhaus, M. 833
Ni, Y.M. 329
Nieczkoski, S.J. 443
Niemann, R.C. 99
Nikl, M. 773
Nishi, M. 155
Nissen, J.A. 341
Nomi, K. 431
Noto, K. 57, 685, 1039
Nunogaki, M. 1039
Nyeki, J. 961

Obukhov, S.A. 237
Ochiai, S. 303
Odin, J. 89
Ogawa, R. 603
Oh, S.S. 303
Ohtan, Y. 953
Okada, T. 1039
Okaji, M. 163, 1007
Okamura, T. 187
Okuda, H. 431
Okuno, K. 155, 1015
Osamura, K. 303
Oswald, R. 335, 549
Ottoboni, V. 529

Paduano, J.D. 399
Pallottino, G.V. 1045
Palumbo, P. 1001
Pan, H.L. 641
Pasztor, G. 805
Patel, S. 251, 309, 537, 947, 1023, 1031
Pavlik, V. 961
Pazzi, G.P. 773
Pekola, J.P. 843
Peters, H.C. 753
Petrinski, J.N. 487
Pickett, D.A. 393
Pissanetzky, S. 795
Polak, M. 315
Provost, J. 63
Pujol, S. 421
Pukhov, A.A. 761

Pulkert, G. 389

Rakhmanov, A.L. 761
Rall, M. 957
Ramadan, N.H. 563
Ramamurthy, V. 609
Ranfagni, A. 773
Raveau, B. 63, 941
Ravikumar, K.V. 451
Reed, R.P. 909
Richards, P.L. 213, 221
Rong, X.S. 329
Ross Jr, R.G. 435
Rudman, I.T. Kh. 555
Rumaner, L. 753

Sahoo, R.K. 203, 475
Saito, T. 1039
Sakai, K. 277
Sakatsume, S. 953
Salerno, L.J. 649
Sarma, C. 287
Sasaki, T. 155
Sassoli, K. 773
Saunders, J. 167
Sawada, A. 953
Scarmuzzi, F. 1001
Schallig, R. 389
Schhindler, G. 287
Schmidt, C. 3
Schmidtchen, U. 105
Schottler, R.M. 825
Schwabbauer, P. 389
Seidel, A. 389
Seki, N. 187
Selim, R. 119
Sen, P. 241
Seol, S.Y. 513, 520
Settai, R. 953
Shapiro, J.C. 407
Shavit, A. 19
Shaw, D.T. 537, 1031
Shchegolev, I.O. 1011
Shi, Z.X. 329
Shibutani, K. 603
Shimamoto, S. 1015
Shirron, P. 349, 361, 369
Simon, Ch. 63
Skyba, P. 739, 961
Sloan, R.B. 717
Smedley, G. 435
Smith Jr, J.L. 929
Smith, J.L. 263
Smolka, N. 739, 961
Sopko, B. 773
Spiro, C.L. 753
Spivak, A.L. 649
Stouffer, C. 393
Sugimoto, M. 155
Sullivan, N.S. 957
Sumiyoshi, F. 293
Sumption, M.D. 491
Suzuki, T. 187
Swaminathan, G. 325, 609
Swanson, D.R. 341
Swenson, C. 813
Swift, G.W. 971

Tachikawa, K. 899
Takacs, S. 679
Takahashi, Y. 155, 1015
Takahata, K. 293
Takano, H. 293
Takeda, N. 745
Tatezaki, F. 685
Telser, E. 579
Therond, P.G. 69
Thiel, R.C. 771
Tsuchimoto, M. 821
Tsuji, H. 155, 1015
Tsukamoto, O. 315
Tu, Z.J. 839
Tuttle, J. 349, 361, 369

Uber, J.M. 357
Uesaka, M. 745
Uhlig, K. 587
Unal, A. 123

Ventura, G. 773
Venugopal, K. 325, 609
Verhaege, T. 543
Villere, G.L. 407
Volokitin, Ua, E. 771
Voloshin, F. 83
Volz, S. 375

Wada, H. 899
Wagner, Th, 167, 655
Wahl, A. 941
Wakuta, Y. 935
Walters, C.R. 899
Wang, C. 31
Wang, F. 613
Wang, J.J. 713
Wang, R. 983
Wang, S. 613
Wang, Z. 613
Ward, M. 335, 549
Watanabe, K. 953, 1039
Watson, J.H.P. 507
Weintz, K. 357, 375
Wellhofer, F. 671
Wendling, N. 89
Wesche, R. 145, 805
Wise, S.A. 119
Witt, R.J. 415, 563
Wong, F. 537
Wong, K.W. 667
Wu, P. 31

Xin, Y. 667
Xu, B. 667

Yamamoto, J. 679
Yao, X.X. 329
Yoshida, K. 155
Yoshiki, H. 277
Yoshizawa, S. 57
Yu, T.F. 245
Yuan, S.W.K. 383
Yuan, W. 613

Zahariev, A.L. 487
Zannella, S. 529
Zeng, Z.Y. 329
Zhang, P.Q. 839
Zhang, Z. 839
Zhao, L.Z. 839
Zhao, Z.X. 329
Zhou, Y. 713
Zhu, S.W. 591
Zhu, W.X. 713
Zirizzotti, A.E. 1045
Zmitrochenko, J.V. 227
de Bernardis, P. 1001
de Boer, P.C.T. 699
de Jongh, L.J. 771
von Flotow, A.H. 399

Keyword index

A.c. losses
Calorimetry, Measuring techniques 3
Superconductor stability, Multifilamentary wires 83
Bi-2223, Superconducting magnet 603
Superconducting cables, Time constants 679
A.c. superconductors
Current–voltage characteristics, Self-field effect 315
Absorption refrigeration cycle
Thermodynamics, Cooling rate 997
Adiabatic demagnetization
Refrigerators, Space cryogenics 213, 221
Superconducting magnets, Current source 739
Adiabatic losses
Stirling cryocoolers, Stratified flow model 627
Adsorption pumps
Cryorefrigerators, Mathematical models 227
Angular magnetoresistance
High T_c superconductors, Silver sheathed BPSCCO tapes 609
Available designs
Space cryogenics, Infrared detectors 425

BSCCO
Flux jumping, Instabilities 507
Barrier growth
Nb/Al_2O_3-Al/Nb, Josephson junctions 833
Basic pulse-tube refrigerator
Thermodynamic analysis, Model 699
Bi-2212
High T_c superconductors, Critical current density 251
High T_c superconductors, Critical temperature 947
Bi-2212/Ag wires
High T_c superconductors, Critical currents 805
Bi-2223
Superconducting magnet, a.c. losses 603
Bi-2223 tapes
V–I characteristics, Sausaging effect 303
Superconducting properties, Processing parameters 325

Bi-Sr-Ca-Cu-O
Silver doping, Thermal conductivity 685
BiPbSrCaCuO
Critical currents, Textured films 613
Bolometers
Space cryogenics, ^{3}He refrigerators 1001

CLAES
Space cryogenics, Cryostat 393
CMOS
Device isolation, Freeze-out 689
Cable-in-conduit conductors
Transversal heat transfer, Numerical analysis 659
Stability, Heat transfer 779
Limiting current, Stability 787
Calibration
Thin film platinum resistance thermometers, Mathematical description 487
Calorimeters
Helium boil-off, Thermodynamics 99
Calorimetry
A.c. losses, Measuring techniques 3
Capacitance
GaAs based varicap, Ultra-low temperatures 773
Ceramics
High T_c superconductors, Thermal expansion 163
Chemical vapour deposition
Nb_3Sn, Superconducting joints 753
Co-axial pulse tube refrigerator
Refrigeration, Multi-bypass method 713
Command and monitoring system
Space cryogenics, SHOOT 407
Composite superconductors
Tape/film superconductors, Stability criterion 513
Normal zone acceleration, Thermomagnetic instability 761
Computer model
Stirling cycle, Multiple stage cryocoolers 727
Computer simulation
T_c superconductors, Quench propagation velocity 129
Contact conductance
Stainless steel screens, Space cryogenics 451
Cooling rate
Thermodynamics, Absorption refrigeration cycle 997
Coupling losses
Superconducting cables, Current distribution 293
Critical current measurement methods
Nb_3Sn, Interlaboratory comparison 899
Critical current density
High T_c superconductors, Bi-2212 251
High T_c superconductors, Mechanical strain effects 309
Y-Ba-Cu-O, Flux pinning potentials 329
Critical state, Thick films 671
Critical currents
BiPbSrCaCuO, Textured films 613
High T_c superconductors, Bi-2212/Ag wires 805
Flux pinning, High T_c superconductors 941
Critical heat flux density
Superfluid helium, Heat transfer 983
Critical state
Critical current density, Thick films 671
Critical temperature
High T_c superconductors, Bi-2212 947
Cryogen expulsion
Space cryogenics, Zero gravity 415
Cryocoolers
Pulse tube refrigerators, Liquid helium temperature 25
Stirling refrigerators, Numerical models 383
Space cryogenics, Vibration reduction 399
Space cryogenics, Dilution refrigerators 421
Resonance characterization, Space cryogenics 435
Thermodynamic analysis, Ericcson cycle 483
Pulse tube refrigerators, Isothermal model 591
Cryogen tanks
Space cryogenics, Support straps 389
Cryogenic vibration test
Dynamic Young's modulus, Space materials 839
Cryorefrigerants
Helium transfer, Thermodynamics 51
Cryorefrigerators
Adsorption pumps, Mathematical models 227
Gifford–McMahon cycle, Theoretical analysis 271
Cryostability
Superconducting magnets, Winding structure 1011
Cryostats
Superfluid helium, Ultracold neutrons 277
Space cryogenics, CLAES 393
Laser Crystals, Crystal cooling 550
Crystal cooling
Cryostats, Laser Crystals 550
CuNb alloy
Superconducting wires, Reinforcing stabilizer 1039
Current distribution
Superconducting coils, Superconductor stability 155
Superconducting cables, Coupling losses 293
Current imbalance
Superconducting coils, Stabilization 1015
Current lead model
High Tc superconductivity, Hybrid superconducting–normal metal current 543
Current leads
High T_c superconductors, Thermal behaviour 145
Design chart, RRR values 935
Current source
Adiabatic demagnetization, Superconducting magnets 739
Current–voltage characteristics
A.c. superconductors, Self-field effect 315

D.c. SQUID
JFET cooled amplifier, Design considerations 1045
Design chart
Current leads, RRR values 935
Design considerations
Pressure gauges, Measuring instruments 167
Magnetic refrigerators, Regenerative characteristics 263
Dilution refrigerators, Nuclear demagnetization stages 335, 549
Space cryogenics, ^{4}He refrigerator 635
D.c. SQUID, JFET cooled amplifier 1045
Design modifications
Pulse tube refrigerators, Numerical analyses 31
^{3}He/^{4}He dilution refrigerator, Gifford–McMahon closed cycle refrigerator 587
Device isolation
CMOS, Freeze-out 689
Dielectric breakdown
Liquid helium, Gap size effect 579
Dilution refrigerators
Nuclear demagnetization stages, Design considerations 335, 549
Space cryogenics, Cryocoolers 421
Small scale refrigeration, Helium consumption 843
Dynamic Young's modulus
Cryogenic vibration test, Space materials 839
Dynamic analysis
Stirling cycle cryocoolers, Thermodynamics 43

Electrical coils
Magnetic core materials, Material properties 241
Electrical properties
Superconductors, Melt textured YBCO 63
Ericcson cycle
Thermodynamic analysis, Cryocoolers 483
Exergy maximization

Regenerators, Theoretical analysis 475
Exfoliated graphite
Radio frequency shielding, NMR study substrate 957

Fabrication defects
Superconducting tapes, Theoretical models 537
Fibre reinforcement
Undirectional composites, Physical properties 909
Fine-filamentary superconductors
Magnetization, Magnetic susceptibility 529
Flow rate instabilities
Heat influx, Self-sustained cooling 555
Flow structure
Thermal counterflow jet, He II 991
Flux jumping
BSCCO, Instabilities 507
Flux pinning
Critical currents, High T_c superconductors 941
Flux pinning potentials
Y-Ba-Cu-O, Critical current densities 329
Forced flow helium
SMES, Indirect cooling 825
Freeze-out
CMOS, Device isolation 689
Frozen field model
High T_c superconductors, Levitation force 821

GaAs
Hall sensors, Shubnikov–de Hass oscillation 953
GaAs based varicap
Capacitance, Ultra-low temperatures 773
Gap size effect
Dielectric breakdown, Liquid helium 579
Gifford–McMahon closed cycle refrigerator
^{3}He/^{4}He dilution refrigerator, Design modifications 587
Gifford–McMahon cycle
Cryorefrigerators, Theoretical analysis 271
Refrigerators, MRI cryostats 717
Gradiometer
High T_c RF SQUID, Non-destructive testing 667
Grain boundaries
High T_c superconductors, Josephson junctions 287

Hall sensors
GaAs, Shubnikov–de Hass oscillation 953
He II
Thermal counterflow jet, Flow structure 991
^{3}He/^{4}He dilution refrigerator
Gifford–McMachon closed cycle refrigerator, Design modifications 587
^{3}He refrigerators
Space cryogenics, Bolometers 1001
^{4}He refrigerator
Space cryogenics, Design considerations 635
Heat capacity
Thermometers, Thick-film resistors 771
Heat diffusion
High T_c thin films, Normal zone propagation 69
Heat influx
Flow rate instabilities, Self-sustained cooling 555
Heat shields
Nuclear refrigerators, Paper-based design 961
Heat transfer
Thermodynamics, Thermal waves 203
Helium, Mathematical model 733
Cable-in-conduit conductors, Stability 779
Superfluid helium, Critical heat flux density 983
Heat transport
Superfluid helium, Phase transition 187
Helium
Polymers, Permeation 105
Measuring methods, Superfluid turbulent flow 179
Two-fluid model, Natural convection 563
Sloshing dynamics, Mathematical analysis 641
Heat transfer, mathematical model 733
Helium boil-off
Calorimeters, Thermodynamics 99
Helium consumption
Dilution refrigerators, Small scale refrigeration 843
Helium transfer
Cryorefrigerants, Thermodynamics 51
High T_c RF SQUID
Gradiometer, Non-destructive testing 667
High T_c superconductivity
Space cryogenics, Remote sensing 119
Hybrid superconducting–normal metal current leads, Current lead mode 543
High T_c superconductors
Quench energies, Mathematical models 77
Quench propagation velocity, Computer simulation 129
Current leads, Thermal behaviour 145
Ceramics, Thermal expansion 163
Melt-textured YBCO, Microdefects 245
Critical current density, Bi-2212 251
Grain boundaries, Josephson junctions 287
Critical current density, Mechanical strain effects 309
Silver sheathed BPSCCO tapes, Angular magnetoresistance 609
Magnetic levitation, YBaCuO 745
Critical currents, Bi-2212/Ag wires 805
Frozen field model, Levitation force 821
Flux pinning, Critical currents 941
Critical temperature, Bi-2212 947
Superconducting tapes, Oxygen diffusion 1023
Superconducting tapes, Powder-in-tube technique 1031
High T_c thin films
Normal zone propagation, Heat diffusion 69
High frequency thermal modulation
Laser diode, Superconductors 597
Hot spot temperature
Normal zone voltage, Normal zone propagation velocity 111
Hybrid superconducting–normal metal current leads
High T_c superconductivity, Current lead model 543

Indirect cooling
SMES, Forced flow helium 825
Infrared detectors
Space cryogenics, Available designs 425
Instabilities
Flux jumping, BSCCO 507
Interlaboratory comparison
Nb_3Sn, Critical current measurement methods 899
Interstrand resistance
SSC magnets, Quench location 813
Isothermal model
Pulse tube refrigerators, Cryocoolers 591

JFET cooled amplifier
D.c. SQUID, Design considerations 1045
Joints
Thermal conductance, YBCO 89
Josephson junctions
High T_c superconductors, Grain boundaries 287
Nb/Al_2O_3-Al/Nb, Barrier growth 833
Joule–Thomson cryocooler
Performance, Theoretical analysis 723
Joule–Thomson effect
Thermodynamics, Mathematical models 19

Lambda point
Space cryogenics, Thermometry 341

Laser Crystals
Cryostats, Crystal cooling 550
Laser diode
High frequency thermal modulation, Superconductors 597
Levitation force
High T_c superconductors, Frozen field model 821
Limiting current
Cable-in-conduit conductors, Stability 787
Liquid acquisition devices
Space cryogenics, SHOOT 361
Liquid helium
Dielectric breakdown, Gap size effect 579
Liquid helium temperature
Pulse tube refrigerators, Cryocoolers 25
Pulse tube refrigerators, Multiple staging configuration 259
Thermal conductance, Pressed metallic contacts 649

MRI cryostats
Gifford–McMahon cycle, Refrigerators 717
Magnetic core materials
Electrical coils, Material properties 241
Magnetic fields
Platinum resistance thermometer, Magnetoresistance 1007
Magnetic levitation
High T_c superconductors, YBaCuO 745
Magnetic refrigerators
Regnerative characteristics, Design considerations 263
Magnetic susceptibility
Magnetization, Fine-filamentary superconductors 529
Magnetization
Proximity effect, Multifilamentary composites 491
Magnetic susceptibility, Fine-filamentary superconductors 529
Magnetoresistance
Platinum resistance thermometer, Magnetic fields 1007
Material properties
YBCO, Thermal conductivity 57
Electrical coils, Magnetic core materials 241
Thermal conductivity, Wood 655
Mathematical analysis
Helium, Sloshing dynamics 641
Mathematical description
Thin film platinum resistance thermometers, Calibration 487
Mathematical model
Helium, Heat transfer 733
Mathematical models
Joule–Thomson effect, Thermodynamics 19
Stirling refrigerators, Thermodynamics 37
High T_c superconductors, Quench energies 77
Cryorefrigerators, Adsorption pumps 227
Measuring instruments
Pressure gauges, Design considerations 167
Measuring methods
Helium, Superfluid turbulent flow 179
Measuring techniques
Calorimetry, A.c. losses 3
Mechanical strain effects
High T_c Superconductors, Critical current density 309
Melt-textured YBCO
Superconductors, Electrical properties 63
High T_c superconductors, Microdefects 245
Microdefects
High T_c superconductors, Melt-textured YBCO 245
Model
Thermodynamic analysis, Basic pulse-tube refrigerator 699
Multi-bypass method
Refrigeration, Co-axial pulse tube refrigerator 713
Multifilamentary composites
Proximity effect, magnetization 491
Multifilamentary wires
Superconductor stability, A.c. losses 83
Multiple stage cryocoolers
Stirling cycle, Computer model 727
Multiple staging configuration
Pulse tube refrigerators, Liquid helium temperature 259

NMR study substrate
Radio frequency shielding, Exfoliated graphite 957
Natural convection
Helium, Two-fluid model 563
Nb/Al_2O_3-Al-Nb
Josephson junctions, Barrier growth 833
Nb_3Sn
Superconducting joints, Chemical vapour deposition 753
Critical current measurement methods, Interlaboratory comparison 899
Non-destructive testing
High T_c FR SQUID, Gradiometer 667
Normal zone acceleration
Composite superconductors, Thermomagnetic instability 761
Normal zone propagation
High T_c thin films, Heat diffusion 69
Normal zone propagation velocity
Normal zone voltage, Hot spot temperature 111
Normal zone voltage
Normal zone propagation velocity, Hot spot temperature 111
Nuclear demagnetization stages
Dilution refrigerators, Design considerations 335, 549
Nuclear refrigerators
Heat shields, Paper-based design 961
Numerical analyses
Pulse tube refrigerators, Design modifications 31
Transient forced flow, Supercritical helium 195
Transversal heat transfer, Cable-in-conduit conductor 659
Numerical models
Stirling refrigerators, Cryocoolers 383

Oxygen diffusion
High T_c superconductors, Superconducting tapes 1023

Paper-based design
Heat shields, Nuclear refrigerators 961
Performance
Joule–Thomson cryocooler, Theoretical analysis 723
Refrigeration systems, Thermodynamics 929
Permeation
Helium, Polymers 105
Phase transition
Superfluid helium, Heat transport 187
Physical properties
Undirectional composites, Fibre reinforcement 909
Platinum resistance thermometer
Magnetic fields, Magnetoresistance 1007
Polymers
Helium, Permeation 105
Powder-in tube technique
High T_c superconductors, Superconducting tapes 1031
Pressed metallic contacts
Thermal conductance, Liquid helium temperatures 649
Pressure gauges
Measuring instruments, Design considerations 167
Processing parameters
Bi-2223 tapes, Superconducting properties 325
Proximity effect
Multifilamentary composites, Magnetization 491
Pulse tube refrigerators
Liquid helium temperature, Cryocoolers 25
Design modifications, Numerical analyses 31
Multiple staging configuration, Liquid helium temperature 259
Isothermal model, Cryocoolers 591

Quench energies
High T_c superconductors, Mathematical models 77

Quench location
SSC magnets, Interstrand resistance 813
Quench propagation velocity
Computer simulation, High T_c superconductors 129
Quench protection
Superconducting magnets, Quench simulation 795
Quench recovery
Superconductors, Stability performance 123
Quench simulation
Superconducting magnets, Quench protection 795
Quenching
Superconductors, Stability performance 520

RRR values
Current leads, Design chart 935
Radio frequency shielding
Exfoliated graphite, NMR study substrate 957
Recuperator
Stirling refrigerator, Superfluid 971
Refrigeration
Multi-bypass method, Co-axial pulse tube refrigerator 713
Refrigeration systems
Thermodynamics, Performance 929
Refrigerators
Thermodynamics, Viscous expanders 9
Adiabatic demagnetization, Space cryogenics 213, 221
Gifford–McMahon cycle, MRI cryostats 717
Regenerative characteristics
Magnetic refrigerators, Design considerations 263
Regenerators
Exergy maximization, Theoretical analysis 475
Reinforcing stabilizer
Superconducting wires, CuNb alloy 1039
Remote sensing
High T_c superconductivity, Space cryogenics 119
Resistance thermometers
Thermometry, Semiconductors 237
Resonance characterization
Cryocoolers, Space cryogenics 435

SHOOT
Space cryogenics, Superfluid helium transfer 349
Space cryogenics, Support straps 357
Space cryogenics, Liquid acquisition devices 361
Space cryogenics, Thermal stratification 369
Space cryogenics, Verification testing 375
Space cryogenics, Command and monitoring system 407
SMES
Indirect cooling, Forced flow helium 825
SSC magnets
Interstrand resistance, Quench location 813
Sausaging effect
Bi-2223 tapes, V–I characteristics 303
Self-field effect
A.c. superconductors, Current–voltage characteristics 315
Self-sustained cooling
Flow rate instabilities, Heat influx 555
Semiconductors
Thermometry, Resistance thermometers 237
Shubnikov–de Hass oscillation
Hall sensors, GaAs 953
Silver doping
Bi-Sr-Ca-Cu-O, Thermal conductivity 685
Silver sheathed BPSCCO tapes
High T_c superconductors, Angular magnetoresistance 609
Sloshing dyanamics
Helium, Mathematical analysis 641
Small scale refrigeration
Dilution refrigerators, Helium consumption 843
Space cryogenics
High T_c superconductivity, Remote sensing 119
Adiabatic demagnetization, Refrigerators 213, 221
Lambda point, Thermometry 341
Superfluid helium transfer, SHOOT 349
SHOOT, Support straps 357
SHOOT, Liquid acquisition devices 361
SHOOT, Thermal stratification 369
SHOOT, Verification testing 375
Cryogen tanks, Support straps 389
CLAES, Cryostat 393
Cryocoolers, Vibration reduction 399
SHOOT, Command and monitoring system 407
Croygen expulsion, Zero gravity 415
Dilution refrigerators, Cryocoolers 421
Infrared detectors, Available designs 425
Cryocoolers, Resonance characterization 435
Superfluid helium Dewar, Stirling cycle cooler 443
Contact conductance, Stainless steel screens 451
^{4}He refrigerator, Design considerations 635
^{3}He refrigerators, Bolometers 1001
Space materials
Dynamic Young's modulus, Cryogenic vibration test 839
Stability
Cable-in-conduit conductors, Heat transfer 779
Cable-in-conduit conductors, Limiting current 787
Stability criterion
Composit superconductors, Tape/film superconductors 513
Stability performance
Superconductors, Quench recovery 123
Superconductors, Quenching 520
Stabilization
Superconducting coils, Current imbalance 1015
Stainless steel screens
Contact conductance, Space cryogenics 451
Stirling cryocoolers
Adiabatic losses, Stratified flow model 627
Stirling cycle
Multiple stage cryocoolers, Computer model 727
Stirling cycle cooler
Superfluid helium Dewar, Space cryogenics 443
Stirling cycle cryocoolers
Thermodynamics, Dynamic analysis 43
Two-stage regenerator in space cryogenics 431
Stirling refrigerators
Mathematical models, Thermodynamics 37
Numerical models, Cryocoolers 383
Recuperator, Superfluid 971
Stratified flow model
Stirling cryocoolers, Adiabatic losses 627
Superconducting cables
Coupling losses, Current distribution 293
A.c. losses, Time constants 679
Superconducting coils
Current distribution, Superconductor stability 155
Current imbalance, Stabilization 1015
Superconducting joints
Nb_3Sn, Chemical vapour deposition 753
Superconducting magnet
Bi-2223, A.c. losses 603
Superconducting magnets
Adiabatic demagnetization, Current source 739
Quench simulation, Quench protection 795
Winding structure, Cryostability 1011
Superconducting properties
Bi-2223 tapes, Processing parameters 325
Superconducting tapes
Theoretical models, Fabrication defects 537

High T_c superconductors, Oxygen diffusion 1023
High Tc superconductors, Powder-in-tube technique 1031
Superconducting wires
CuNb alloy, Reinforcing stabilizer 1039
Superconductor stability
A.c. losses, Multifilamentary wires 83
Superconducting coils, Current distribution 155
Superconductors
Melt-textured YBCO, Electrical properties 63
Stability performance, Quench recovery 123
Stability performance, Quenching 520
Laser diode, High frequency thermal modulation 597
Supercritical helium
Transient forced flow, Numerical analysis 195
Superfluid
Recuperator, Stirling refrigerator 971
Superfluid helium
Heat transport, Phase transition 187
Cryostats, Ultracold neutrons 277
Critical heat flux density, Heat transfer 983
Superfluid helium Dewar
Stirling cycle cooler, Space cryogenics 443
Superfluid helium transfer
Space cryogenics, SHOOT 349
Superfluid turbulent flow
Measuring methods, Helium 179
Support straps
Space cryogenics, SHOOT 357
Space cryogenics, Cryogen tanks 389

Tape/film superconductors
Composit superconductors, Stability criterion 513
Textured films
Critical currents, BiPbSrCaCuO 613
Theoretical analysis
Cryorefrigerators, Gifford–McMahon cycle 271
Regenerators, Exergy maximization 475
Joule–Thomson crycooler, Performance 723
Theoretical models
Superconducting tapes, Fabrication defects 537
Thermal behaviour
High T_c superconductors, Current leads 145
Thermal conductance
Joints, YBCO 89
Pressed metallic contacts, Liquid helium temperatures 649
Thermal conductivity
YBCO, Material properties 57
Wood, Material properties 655
Bi-Sr-Ca-Cu-O, Silver doping 685
Thermal counterflow jet
Flow structure, He II 991
Thermal expansion
High T_c superconductors, Ceramics 163
Thermal stratification
Space cryogenics, SHOOT 369
Thermal waves
Thermodynamics, Heat transfer 203
Thermodynamic analysis
Cryocoolers, Ericcson cycle 483
Basic pulse-tube refrigerator, Model 699
Thermodynamics
Refrigerators, Viscous expanders 9
Joule–Thomson effect, Mathematical models 19
Mathematical models, Stirling refrigerators 37
Stirling cycle cryocoolers, Dynamic analysis 43
Helium transfer, Cryorefrigerants 51
Calorimeters, Helium boil-off 99
Heat transfer, Thermal waves 203
Refrigeration systems, Performance 929
Absorption refrigeration cycle, Cooling rate 997
Thermomagnetic instability
Composite superconductors, Normal zone acceleration 761
Thermometers
Thick-film resistors, Heat capacity 771
Thermometry
Resistance thermometers, Semiconductors 237
Space cryogenics, Lambda point 341
Thick films
Critical current density, Critical state 671
Thick-film resistors
Thermometers, Heat capacity 771
Thin film platinum resistance thermometers
Calibration, Mathematical description 487
Time constants
Superconducting cables, A.c. losses 679
Transient forced flow
Supercritical helium, Numerical analysis 195
Transversal heat transfer
Cable-in-conduit conductor, Numerical analysis 659
Two-fluid model
Helium, Natural convection 563
Two-stage regenerator in space cryogenics
Stirling cycle cryocooler 431

Ultra-low temperatures
GaaS based varicap, Capacitance 773
Ultracold neutrons
Cryostats, Superfluid helium 277
Undirectional composites
Fibre reinforcement, Physical properties 909

V–I characteristics
Bi-2223 tapes, Sausaging effect 303
Verification testing
Space cryogenics, SHOOT 375
Vibration reduction
Cryocoolers, Space cryogenics 399
Viscous expanders
Refrigerators, Thermodynamics 9

Winding structure
Superconducting magnets, Cryostability 1011
Wood
Thermal conductivity, Material properties 655

YBCO
Material properties, Thermal conductivity 57
Thermal conductance, Joints 89
YBaCuO
Critical current densities, Flux pinning potentials 329
High T_c superconductors, Magnetic levitation 745

Zero gravity
Space cryogenics, Croygen expulsion 415

Book reviews 255, 694

Calendar 91, 175, 256, 335, 695, 776, 895, 968, 1061

Conference reports 457, 693

Editorials 2, 98

News 169, 619, 963